



FEATURES

- Structural FX Compounds are specially formulated for durability, highly aesthetic appearance, colorability, and weathering, especially for outdoor applications

BENEFITS

- TPOs, our foundation compounds, offer a great balance of impact resistance and stiffness not found in unmodified Polypropylenes
- Nylon Alloys provide even higher performance than TPOs, improving surface gloss and sheen, and offering excellent scratch and mar resistance
- Acrylic-Styrene-Acrylonitrile (ASA) Alloys offer even more dimensional stability, a high gloss finish, UV and thermal stability, and good chemical resistance

Improving Performance AND Aesthetics

Structural FX (Effects) Compounds from RTP Company provide more than just great performance... they can improve the aesthetic appeal of your application!

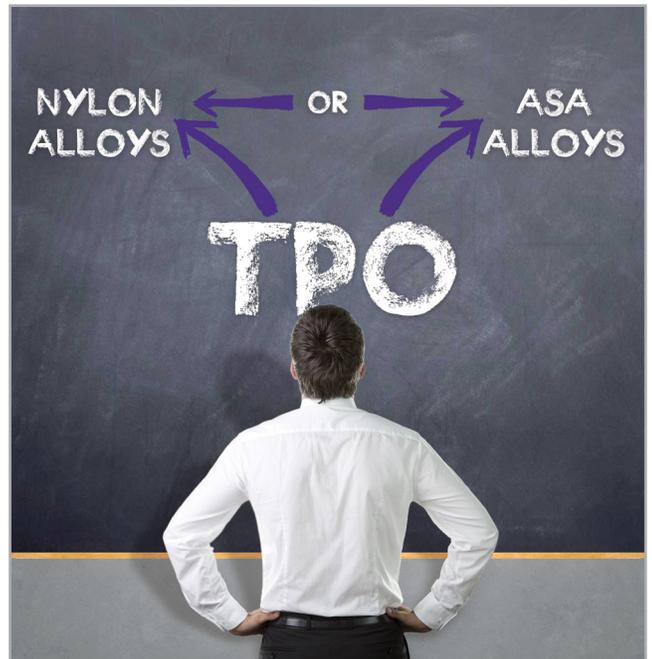
Our Structural FX Compounds are available as TPOs, Nylon Alloys, or ASA Alloys to provide you with a range of performance properties and aesthetic choices for the ultimate in design flexibility!

Each of the Structural FX Compounds provides a different set of properties to make your application a success... whether you choose Thermoplastic Olefins (TPOs), Nylon Alloys, or ASA Alloys, your application will stand out with the durability you require, and the color and sheen your end-use customers prefer.

Due to their UV and temperature stability, our Structural FX Compounds are especially well-suited for outdoor applications where weatherability is important.

Our compounds can be tailored to fit specific requirements, including strength, stiffness, chemical resistance, scratch and mar resistance, UV performance, thermal stability, color, and more, providing your product with excellent performance and market appeal! In addition, these compounds are available on a global basis from RTP Company facilities worldwide, offering reliable and dependable service wherever you need it.

Structural FX Compounds... another series of engineered thermoplastic compounds, brought to you by the innovators at RTP Company!



Whether you choose TPOs, Nylon Alloys, or ASA Alloys, our Structural FX compounds deliver performance and aesthetics!



STRUCTURAL FX COMPOUNDS

TPOs

TPOs are polypropylene-based materials that are engineered to have ductile behavior, even at low temperatures. These unique materials address the problem of poor impact resistance in Polypropylene (PP) by adding toughness through impact modification. Stiffness similar to standard unfilled Polypropylene grades can be achieved through careful choice of mineral fillers while not sacrificing low temperature impact performance.



HVAC housings manufactured from UV stabilized TPOs can withstand a wide temperature range.

TPOs are a low-cost option for a material that is tough even at low temperatures. When they are UV-stabilized, they exhibit good weathering, and they process easily. Unlike many other resins, TPOs do not necessarily need to be dried before molding, which can save on both time and processing costs.

As shown in Figure 1, when compared to Copolymer Polypropylene or standard 20% talc Homopolymer PP, TPOs have an excellent balance of low temperature ductility and stiffness for great performance in nearly any conditions.

Figure 1: Property Comparison

PROPERTY	Impact Copolymer PP	RTP 4900-0818 (Unfilled TPO)	20% Talc PP	RTP 4920-1620 (Filled TPO - 20% Talc)
Low Temperature Ductility	Fair	Excellent	Poor	Excellent
Melt Flow (g/10 min)	25	18	4	20
Specific Gravity	0.90	0.90	1.04	1.04
Notched Izod (kJ/m ²)	46	50	4	45
Tensile Strength (MPa)	23	17	32	18
Tensile Elongation (%)	>50	>300	>10	>300
Flexural Modulus (MPa)	1030	830	2500	1600

Although limitations in Polypropylene-based TPOs do exist in overall mechanical properties, RTP Company can adjust properties according to specific application requirements and also improve scratch and mar resistance when the application demands it. The materials in Figure 1 represent a starting point; TPO compounds from RTP Company can be modified for:

- UltraViolet (UV) resistance
- Scratch and mar resistance
- Specific performance properties

In addition, RTP Company has developed TPOs with UV stabilization that will not interfere with paint adhesion, which eliminates the need to purchase and inventory multiple materials for painted and unpainted parts.

TPOs...
the place to start!



Need even
higher performance?



High Gloss Impact-Modified Nylon Alloys

Our High Gloss Impact-Modified Nylon Alloys are Nylon (PA)-based materials with higher overall mechanical property profiles than TPOs, including higher stiffness, strength and impact properties. They provide improved surface aesthetics over traditional impact-modified nylons with the same great performance (see Figure 2).

Figure 2: Property Comparison

PROPERTY (DAM)	Unfilled Nylon 6	Standard “super tough” Nylon	RTP 2099 X 141710 A (RTP Nylon Alloy)
Surface Appearance	Excellent	Fair-Good	Excellent
Specific Gravity	1.13	1.08	1.09
Notched Izod (kJ/m ²)	5	80	95
Tensile Strength (MPa)	80	50	45
Tensile Elongation (%)	50	60	65
Flexural Modulus (MPa)	3000	1900	1900
Flow/Processability	++	+	++

In addition to the high gloss surface finish that these alloys are capable of achieving, the Nylon base provides better scratch resistance than Polypropylene-based TPO materials, providing a more durable, attractive part throughout the application’s service life.



Outdoor equipment resists scratches and mar, and maintains a highly desirable glossy finish with High Gloss Impact-Modified Nylon Alloys.

Another advantage is that they can be used in higher heat applications where a Polypropylene-based material might experience problems. Through the use of UV stabilizers, weathering of these Nylon Alloys is improved over virgin Nylon.

It should be noted that just like any other Nylon material, our High Gloss Impact-Modified Nylon Alloys are more expensive than TPOs and require thorough drying and higher heat processing. The impact modification results in lower stiffness and strengths than virgin or reinforced Nylons, as well. However, when compared to conventional “super tough” Nylons, these materials maintain better gloss and flow, making them ideal for very large, thin-walled parts where aesthetics are crucial.

Like TPOs, High Gloss Impact-Modified Nylon Alloys can be modified further for other performance-enhancing properties, depending on application requirements.



Need even better dimensional stability and weathering?



Acrylic-Styrene-Acrylonitrile (ASA) Alloys

ASA can be alloyed with multiple resin systems. It can be glass fiber reinforced, and it is compatible with the UV stabilization technologies used with alloyed resins. This allows ASA to be tailored to each individual application need.

Compared to ABS, ASA itself has superior UV Resistance (see Figure 3).

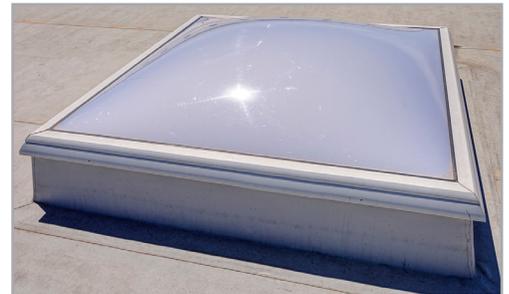


Figure 3: UV Resistance

PROPERTY	ABS	PC/ABS	TPO	Nylon	ASA
UV Resistance	Poor	Poor	Good	Better	Best

RTP Company formulates ASA Alloys for high gloss, colorability, and UV performance. These alloys also have good chemical resistance and thermal stability versus standard ABS. What sets ASA Alloys apart from ABS and TPOs, however, are their weatherability.

As expected, ASA Alloys have superior UV resistance to PC/ABS (see Figure 4). It should also be noted that the properties of PC/ASA are comparable to standard PC/ABS, making it an ideal drop-in replacement when UV performance and weatherability are desired.



Skylight frames manufactured with ASA Alloys last longer due to their remarkable UV resistance and weatherability.

Figure 4: Property Comparison - ASA Alloys vs. ABS Alloys

PROPERTY	RTP 2500 A PC/ABS	RTP 2099 X 135193 PA/ASA	RTP 2099 X 146914 PC/ASA	RTP 2099 X 146912 PBT/ASA	RTP 2099 X 146915 PC/ASA 20% Glass Fiber	RTP 2099 X 146913 PBT/ASA 20% Glass Fiber
UV Resistance	Poor	Good	Excellent	Excellent	Excellent	Excellent
Specific Gravity	1.15	1.09	1.15	1.25	1.28	1.40
Notched Izod (kJ/m ²)	66	10	58	4.80	11.50	7.00
Tensile Strength (MPa)	60	45	53	47	95	90
Tensile Elongation (%)	>10	>10	>10	>10	2.60	2.50
Flexural Modulus (MPa)	2700	2070	2300	2340	5510	5930

For More Information

To learn more about Special FX Compounds from RTP Company, including TPOs, Nylon Alloy blends, and ASA Alloys, please contact your local representative, or visit our website at www.rtpcompany.com.

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